Searches for new physics using the $t\bar{t}$ invariant mass distribution in pp collisions at $\sqrt{s} = 8\,\text{TeV}$

—Supplemental Material—

The CMS Collaboration
CERN
(Dated: October 25, 2013)

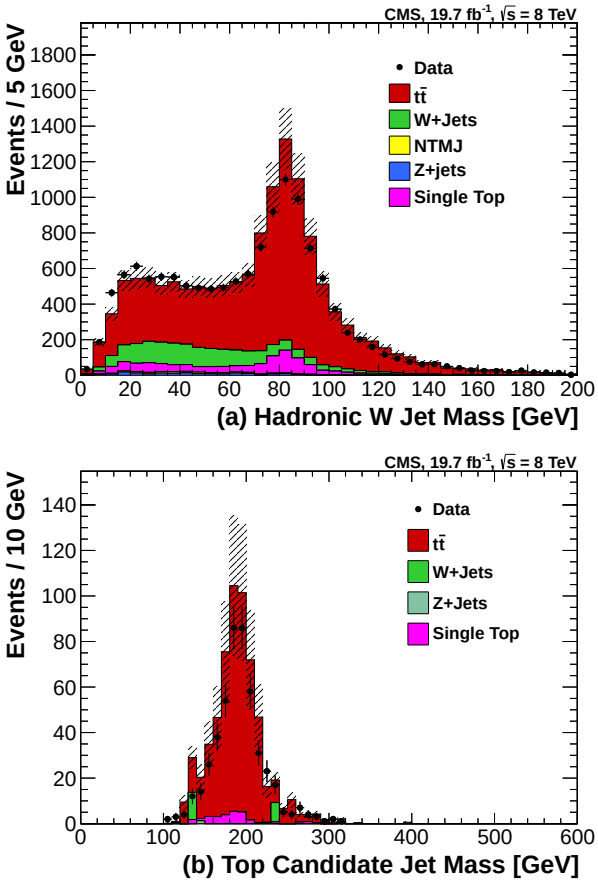

FIG. 1. Jet mass distribution for fully-merged W decay products (a) and fully-merged top quark candidate jets (b), in the muon + jets selection. The shaded band corresponds to the total SM background uncertainty.

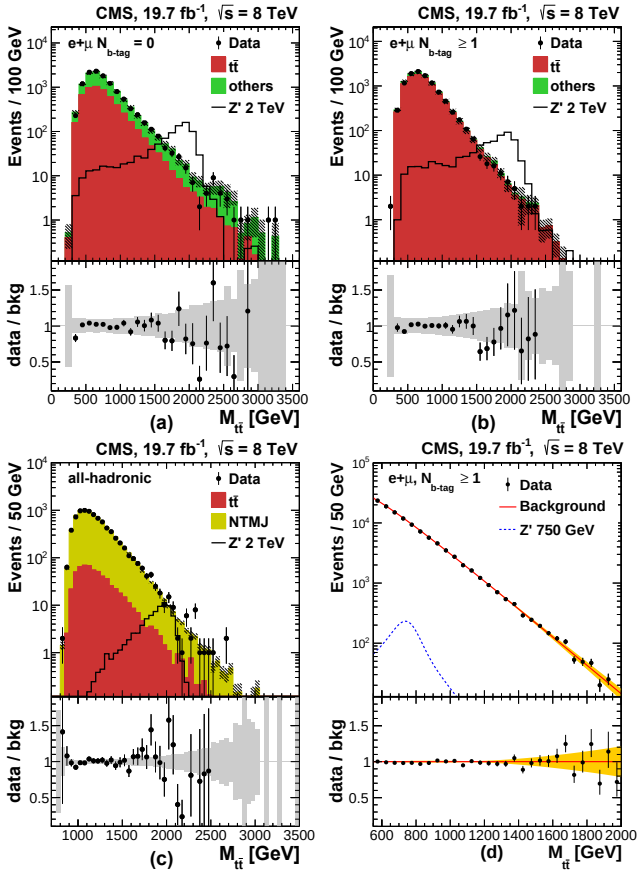

FIG. 2. Plots from Fig. 1 from the Letter, including plots of the ratio of data and total expected background for each analysis channel.

We provide additional plots that illustrate the top-tagging procedure used in the analysis presented in this Letter. Figure 1 shows the distribution of single-jet masses in a selection optimized to identify partially-merged top quark decays. In this topology, the W boson decay products will be merged into a single jet, but the b quark will escape. The figure also shows the jet mass distribution for fully-merged boosted top quarks. The reconstruction of these kinematic observables, in a sample enriched in $t\bar{t}$ events in data, serves to validate the top-tagging algorithm. Further details are given in Ref. 20 of the Letter. We also repeat the plots from Fig. 1 of the main text here in Fig. 2, including ratios to better show the agreement between data and expectation.